

Field, Cereal, and Forage Crops

On-farm Trial Evaluation of Fungicides for Reduction of White Mold in Soybeans in Lebanon, PA, 2024

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White mold (WM), caused by *Sclerotinia sclerotiorum*, causes yield loss and grain contamination in soybean (*Glycine max* (L.) Merr.) in Pennsylvania each year. *S. sclerotiorum* infects soybean flowers when conducive conditions are present, such as cool, moist weather and a dense soybean canopy. WM signs include black sclerotia in the stem and pods and white mycelia on the stem. Other symptoms include leaf wilting, water-soaked lesions, and plant death. This fungicide efficacy trial tests single application and two-pass treatments for preventing white mold in soybean ‘P30A93’ at an on-farm location in Lebanon, Pennsylvania. Results from this trial will provide growers with recommendations for management strategies to reduce yield loss due to WM.

Keywords: Viatude, Aproach, Miravis Neo, Omega, White mold, Sclerotinia stem rot, *Sclerotinia sclerotiorum*

Soybeans ‘P30A93’ were planted in 30-inch rows into minimum-tilled Duffield silt loam on April 16th. The grower managed the field with herbicides according to normal farm operations. Plots were established for eleven treatments, including an untreated check, with four replicates. Plots were four rows wide (ten feet) and thirty feet long. Treatments included an untreated check, Viatude (12 oz ac⁻¹) at R1, Viatude (12 oz ac⁻¹) at R1 and R3, Aproach (9 oz ac⁻¹) at R1, Aproach (9 oz ac⁻¹) at R1 and R3, Miravis Neo (9 oz ac⁻¹) at R1, Miravis Neo (20.8 oz ac⁻¹) at R1 and R3, Omega (16 oz ac⁻¹) at R1, Omega (16 oz

ac⁻¹) at R1 and R3, Delaro Complete (8 oz ac⁻¹) at R1, and Delaro Complete (8 oz ac⁻¹) at R1 and R3. Applications were made with Induce® nonionic surfactant at 0.125% v/v on June 14th (R1) and July 8th (R3). A CO₂ backpack sprayer with 8002VS tips at 25 psi was used. WM disease assessments were completed four weeks after application at R5 on August 8th. Fifty plants were rated per plot on a scale of 0-to-3, where 0=no disease, 1= disease on the lateral branches, 2= disease on the mainstem, and 3= plant death (Grau et al. 1982). The second disease assessment was done at R6 on August 22nd. Disease severity index (DSI) was calculated using the formula from Willbur et al. 2019:

$$DSI = \frac{(disease\ incidence \times disease\ severity)}{3} \times 100$$

Plots were harvested on October 15, and yield and test weight were measured. Yield was corrected to 13% moisture. Data were analyzed using ANOVA with mean separations based on Tukey's HSD ($\alpha=0.05$).

Weather conditions were not conducive for WM development during the flowering period. Although the field has a history of severe white mold, the white mold intensity was low compared to previous years. The untreated check averaged 6.8% DSI at R5 and 10.8% at R6. The untreated check yielded 78.4 bu A⁻¹ and a test weight of 53.7 lb bu⁻¹. At the first disease assessment, two passes of Omega and Viatude significantly reduced DSI. In the second assessment, all two pass fungicides significantly reduced DSI, and all single applications reduced DSI by at least 45%, except for Miravis Neo. There were no significant differences in yield, though all treatments ranged from 0.6-5.5 bu A⁻¹ above the untreated check.

References

- Grau, C. R. and Radke, V. L. 1984. Effects of Cultivars and Cultural Practices on Sclerotinia Stem Rot of Soybean. *Plant Disease* 68:56-57.
- Willbur, J. F., Mitchell, P. D., Fall, M. L., Byrne, A. M., Chapman, S. A., Floyd, C. M., Bradley, C. A., Ames, K., Chilvers, M. I., Kleczewski, K., Malvick, D., Mueller, B., Mueller, D., Kabbage, M.,

Conley, S.P., and Smith, D. L. 2019. Meta-analytic and economic approaches for evaluation of pesticide impact on *Sclerotinia* stem rot control and soybean yield in the North Central United States. *Phytopathology* 109:1157-1170.

Supplementary Table S1. On-farm Trial Evaluation of Fungicides for Reduction of White Mold in Soybeans in Lebanon, PA, 2024

Treatment	Appl. Rate (oz a ⁻¹)	Appl. Timing	White Mold DSI		Yield (bu/A) ^z	Test Weight (lb/bu) ^z
			August 8 (%) ^{yz}	August 22 (%) ^{yz}		
Untreated Check	-	-	6.83 ab	10.83 a	78.4 a	53.7 ab
Viatude	12	R1	3.00 ab	5.67 a-d	81.9 a	53.6 ab
Viatude fb Viatude	12, 12	R1, R3	1.00 b	0.50 d	83.9 a	52.4 b
Aproach	9	R1	2.50 ab	5.33 a-d	81.6 a	54.1 ab
Aproach fb Aproach	9, 9	R1, R3	2.00 ab	2.00 b-d	81.1 a	53.5 ab
Miravis Neo	20.8	R1	6.00 a	9.00 ab	79.4 a	54.2 ab
Miravis Neo fb Miravis Neo	20.8, 20.8	R1, R3	4.33 ab	6.83 a-d	83.2 a	54.4 a
Omega	16	R1	5.67 ab	6.00 a-c	83.0 a	53.6 ab
Omega fb Omega	16, 16	R1, R3	1.33 b	1.00 cd	79.4 a	53.8 ab
Delaro Complete	8	R1	2.67 ab	6.00 a-d	79.0 a	54.0 ab
Delaro Complete fb Delaro Complete	8, 8	R1, R3	0.83 ab	1.50 b-d	82.8 a	54.3 a

^yDisease severity index (DSI)= (disease incidence x disease severity/3) x 100 (Willbur et al. 2019)

^z Means followed by the same letter within columns are not significantly different according to Tukey's LSD (P < 0.05).